CONCEPT OVERVIEW: AERIAL BUOY DRIVEN ELECTRIC GENERATOR

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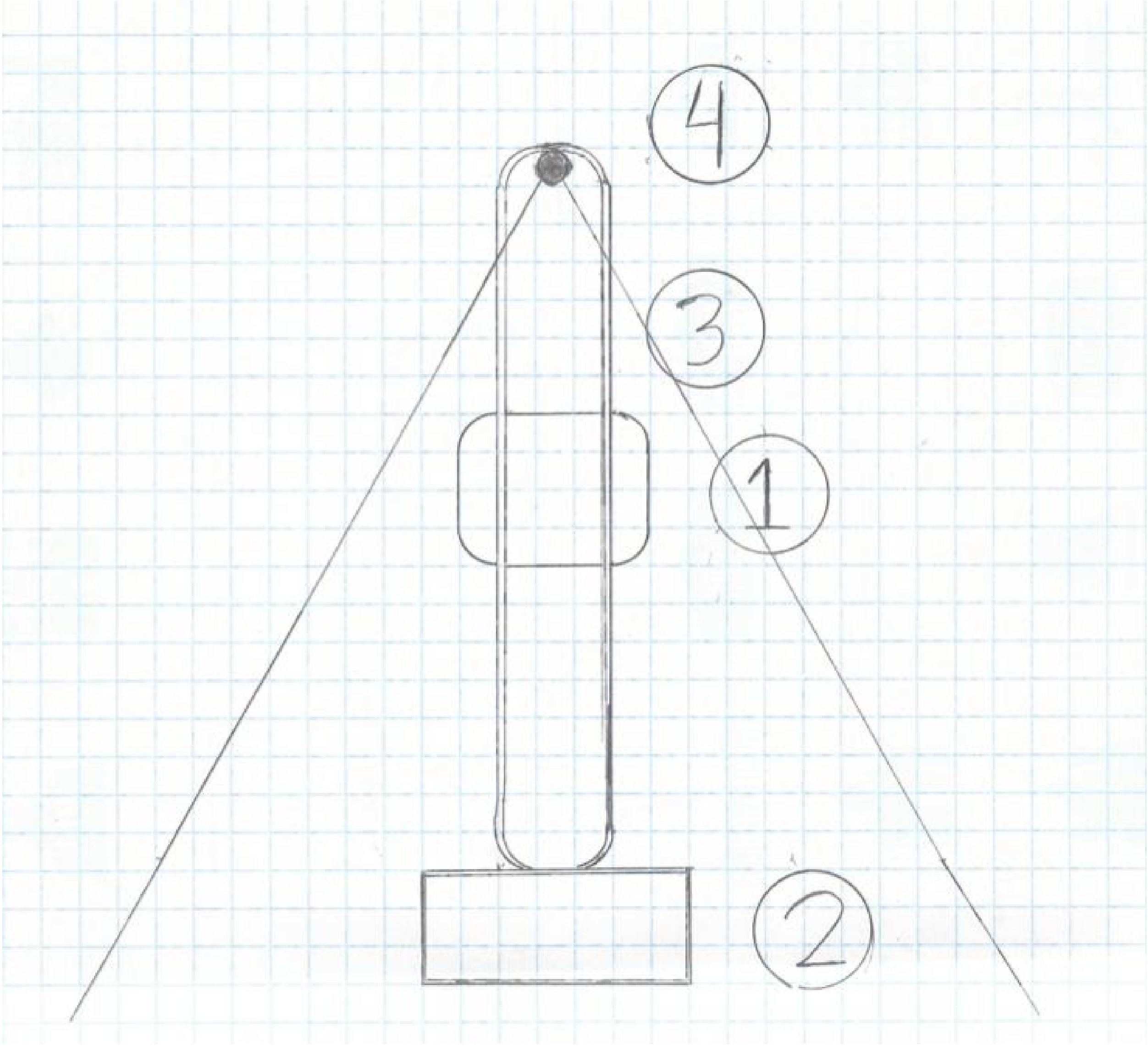
INTRODUCTION

The purpose of this article is to publicly disclose and define novel means for generation of electricity, being the action of an aerial buoy driven generator apparatus. The operation of this system is characterized by the upward action (floatation), and downward action (falling) of an airborne buoy on a dynamo-style generator, generating electricity in the process.

In this article, an abstract definition of the necessary features of a functional design of this style of generator apparatus are presented. The main complex components of this generator style, a general overview of their composition, and the relationships between them in operation are explored and characterized. The information provided will be minimally detailed, and is meant only to convey the basic principles of this style of generator.

GENERATOR COMPOSITION OVERVIEW

The generator apparatus consists of 4 main complex components: 1) the operating buoy/buoy, 2) harvester, 3) operation cables, and 4) static structure.



In the graphic above, the numbers shown identify the following complex components:

1) The operating buoy/buoy: The variably aerially buoyant complex component. In operation, the buoy rises and falls depending on its compression/decompression state.
2) The harvester: The complex component responsible for conversion of the buoy's mechanical energy into electrical output. In operation, this component is directly acted upon by the operation cables, and remotely acted upon by the buoy.
3) The operation cables: These cables transfer the buoy's movement to the harvester. In operation, these cables move bidirectionally, and are acted upon by the buoy.
4) The static structure: These structures serve as dimensional constraints for the operating components.

COMPLEX COMPONENTS'S COMPOSITION OVERVIEW

In this section, the following complex components' function and composition are defined. These technical descriptions minimally restrict the modification, adaptation, and application of the design. They serve to outline the necessary qualitative parameters of this type of generator.
The 4 complex components, 1) the operating buoy/buoy, 2) harvester, 3) operation cables, and 4) static structure, are groups of components that are highly complementary in function.

1) The operating buoy/buoy is the generator apparatus's kinetic energy source. This component consists of a frame, the diaphragm, the lung, a variably compressed gas, and governor system.
-The buoy lung contains variably compressed/decompressed gas as the component's means for augmenting buoyancy.

-The gas is variably compressed/decompressed by the diaphragm to control the buoyancy of the component.
-The governor system controls the diaphragm's operation.

2) The harvester converts the buoy's kinetic output into electrical output. This component is composed of the dynamo, the gearbox, and an electrical output handler.
-The gearbox is operated by/acted upon by the operation cables. It delivers power to the dynamo via the necessary shafts, rotors, and gears of the gearbox.
-The dynamo is operated on by the gearbox.
-The electrical output handler appropriates the electrical power output.

3) The operation cables transfer the buoy's movement to the harvester. They are attached at fixed points on the buoy, looped through pulley elements of the static structure, and fed into the harvester's gearbox.
-The same operation cables are used for both upward and downward buoy action.
-Each cable is looped around a pulley at the ceiling of the buoy's path and through the harvester's gearbox, creating an elliptical shape (the cables are not connected to other cables).

4) The static structure secures the operating components to, and functions as their respective constraints. "Static structure" denotes multiple separate components. These separate components vertical and horizontal cable constrainers, pulley elements, grounding anchors, ceiling of operating buoy travel, and may include an anchoring buoy.
-The ceiling of buoy travel may be directly grounded and upheld by its placement on the ground in the case that it is static, or it

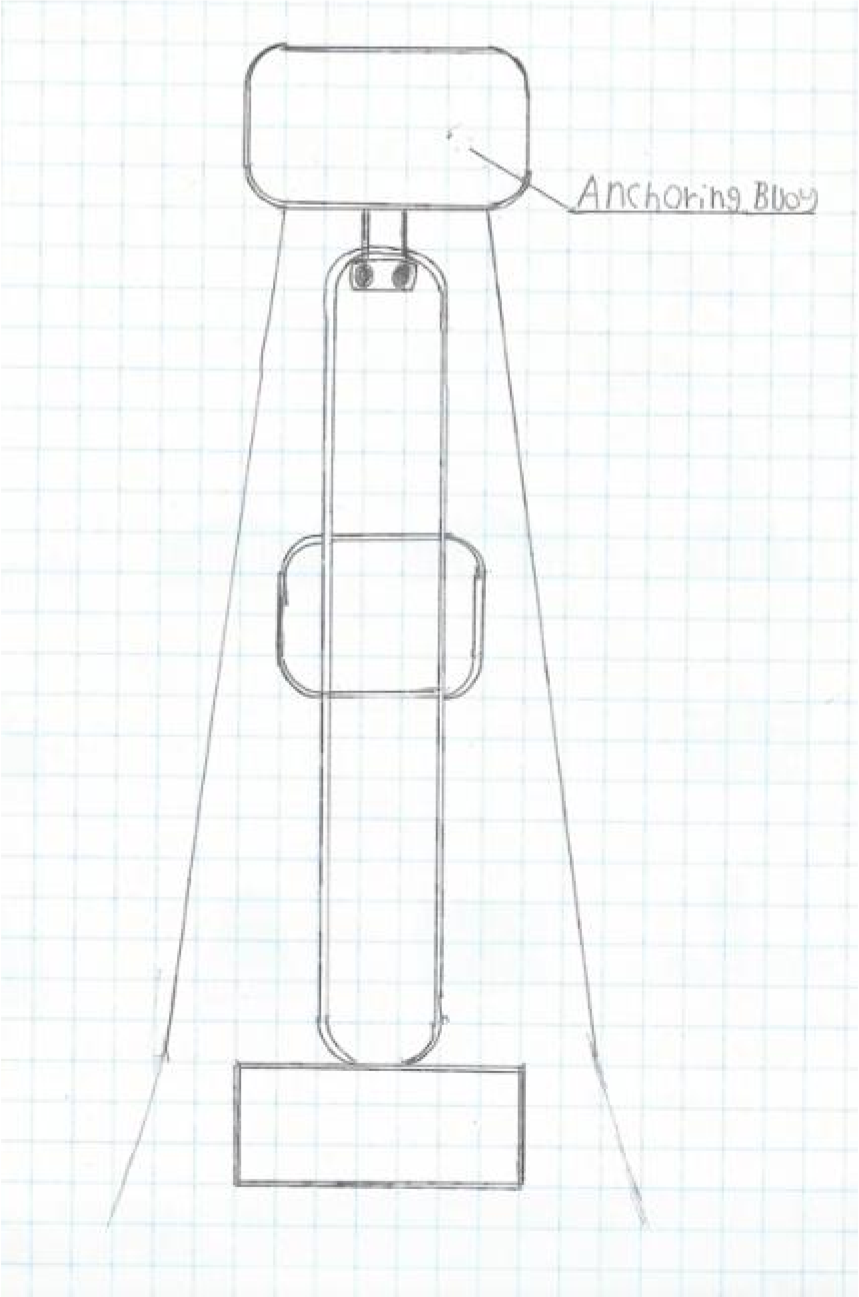
may be grounded by tether and upheld by floatation in the case that it is a dynamically positioned anchor buoy.
-The anchor buoy allows for a high ceiling for the operation of the generator apparatus. This subcomponent includes pulley elements, and is the ceiling of operating buoy travel if included.
-The ceiling keeps the operating cables constrained, and limits shifting of the apparatus.
-Cable constrainers limit shifting of the cables and anchor buoy (if included).

POSSIBLE GENERATOR APPARATUS CONFIGURATIONS

In this section, functional and compositional variation of the complex components is explored. This highlights possible configurations of the generator apparatus and their differences.

The simplest configuration of this generator design is nearly identical to that explored in the composition overview. The only significant addition to that description in this configuration is the definition of the ceiling structure and anchoring structure. In this configuration, the ceiling structure is connected directly to the ground, and is an effectively immovable structure. At the top of this structure is any number of pulley elements with operation cables attached. At the bottom of this structure is any necessary devices to secure the generator, or anchors. Theoretically, this configuration offers the lowest ceiling, and least electrical output for its spatial footprint. Its advantage is its durability and ease of construction.

The next configuration incorporates the anchor buoy discussed in the previous section.



In this above configuration, the anchor buoy is the ceiling of the operating buoy’s travel. This anchor buoy can be positioned very high, maximizing the distance of the operating buoy’s travel and greatly increasing potential for electrical output. This anchor buoy is tethered to the ground to stop upward travel, as it is upheld by its own floatation. It includes any other needed elements of the static structure, such as pulley elements.

These are only two of the many possible effective configurations. According to the purpose of the generator, other elements may be added, and components may be reconfigured and still be variations of this type of generator apparatus.